

**CASE REPORT**

# Intraosseous Lipoma of Calcaneus, Rare Cause of Chronic Calcaneal Pain: A Case Report

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**Abstract**

Intraosseous lipoma is a rare, benign primary tumor occurring in the bone. Herein, we reported a 45-year-old man with chronic right posterior heel pain. In this study, the man was treated conservatively due to plantar fasciitis. During a one-month follow-up visit, the patient had no symptoms of relief in the right heel pain. Initially, calcaneal X-ray was taken, which revealed an expansile unicameral lytic lesion with central calcification on the right calcaneus. Moreover, computed tomography scan revealed an expansile lytic lesion on the right calcaneus. The diagnosis was confirmed as calcaneal lipoma in magnetic resonance imaging. The patient underwent curettage and autogenous iliac crest corticocancellous bone graft under general anesthesia. In a 3-month postoperative follow-up, the patient returned to full ambulation. Postoperative radiographs demonstrated continued remodeling and healing of the graft site. The purpose of this article was to increase awareness among clinicians about the existence of this rare cause of calcaneal pain.

**Level of evidence:** V

**Keywords:** Bone tumor, Calcaneal Lipoma, Foot pain, Intraosseous lipoma

**Introduction**

Intraosseous lipoma is a rare bone tumor with benign nature, which represents only less than 0.1% of primary benign bone tumors in the body (1). The first case report of calcaneal lipoma was published in 1955 in a child (2). Revenga Martinez et al. and Leeson et al. reported the incidence of calcaneal lipoma as 15% (3,4). Although most of the cases are asymptomatic or misdiagnosed, calcaneal lipoma has a high prevalence. Milgram described the calcaneus as the second most common bone to be affected by lipoma in the body (5,6).

The most common presentation of this tumor in the calcaneus is local pain and edema, which may be easily misdiagnosed as plantar fasciitis, bone cyst, gout, retrocalcaneal bursitis, stress fracture, and other bone

tumors (7). Magnetic resonance imaging (MRI) showed a signal similar to fat tissue on T1 and T2 weighted images of the lesion (8). Conservative treatment was only suggested to asymptomatic patients who were diagnosed incidentally using plain radiographs without any risk of fracture (9). A treatment, which is recommended to symptomatic patients, is excisional surgery (10).

In this study, we described a case of calcaneal lipoma in a 45-year-old male patient presenting with chronic posterior heel pain and reported its treatment.

**Case presentation**

A 45-year-old male patient presenting with right

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posterior heel pain was referred to the Sports and Exercise Medicine Ward, Emam Khomeini Hospital, Tehran. He described his pain as severe, starting with the first few steps in the morning or after long periods of non-weightbearing. His pain was aggravated by running and standing for a long time; however, it did not wake him up during night sleep. In this case, there was no complaint about paresthesia in the foot. He had no past medical history, history of trauma, or other forms of injury to the heel. In addition, there was no swelling in the area during the physical examination. There was tenderness on palpation over the anterior and medial aspects of the heel, and it was not over on the medial and lateral aspects of the calcaneus. The ankle and subtalar joint had a full range of motion. The patient was first diagnosed as plantar fasciitis and treated with conservative therapeutic approaches, including footwear modifications, nonsteroidal anti-inflammatory drugs, foot intrinsic muscle exercises and gastrocnemius, and plantar fascia stretching exercises. At the first month of follow-up visit, despite the implementation of the conservative management protocol, no improvement was observed in the patient's pain in the posterior right heel area. The patient was referred for a foot X-ray (anteroposterior, lateral, and oblique views).

X-ray revealed 3.5 to 4-cm unicameral expansile, lytic lesion with sclerotic margins, and minor cortical erosions in the posterior and inferior aspects of the

lesion and central calcification in the right calcaneus [Figure 1]. Although the patient had no pain in his other heel, he was prescribed to undergo the right and left foot X-ray to find the reasons for calcaneal pain [Figure 1]. In addition, computed tomography (CT) scan was ordered to assess the cortical integrity. The results of this examination revealed a sclerotic margin with minor cortical erosions around the lesion in the right heel [Figure 2].

In this study, the patient was referred to an orthopedic surgeon. The patient was also subjected to MRI showing a well-defined lesion with the same signal characteristics as fat. The MRI did not reveal any inflammation in the plantar fascia, and there was no atrophy in the *digiti minimi* (against tarsal tunnel syndrome) or any infective lesion. Therefore, based on these clinical and paraclinical findings, he was diagnosed with intraosseous calcaneal lipoma [figures 3; 4].

He was brought to the inpatient operating room and subjected to curettage and autogenous iliac crest corticocancellous bone graft under general anesthesia. According to the anatomical site and size of the lesion, there was a high probability for articular surface collapse and occurrence of calcaneal fracture.

According to Mirel's criteria for prophylactic fixation, the lesion score was 9; therefore, it was decided to perform prophylactic fixation on the calcaneus with anatomical plate during the operation (11). The procedure went well without any postoperative

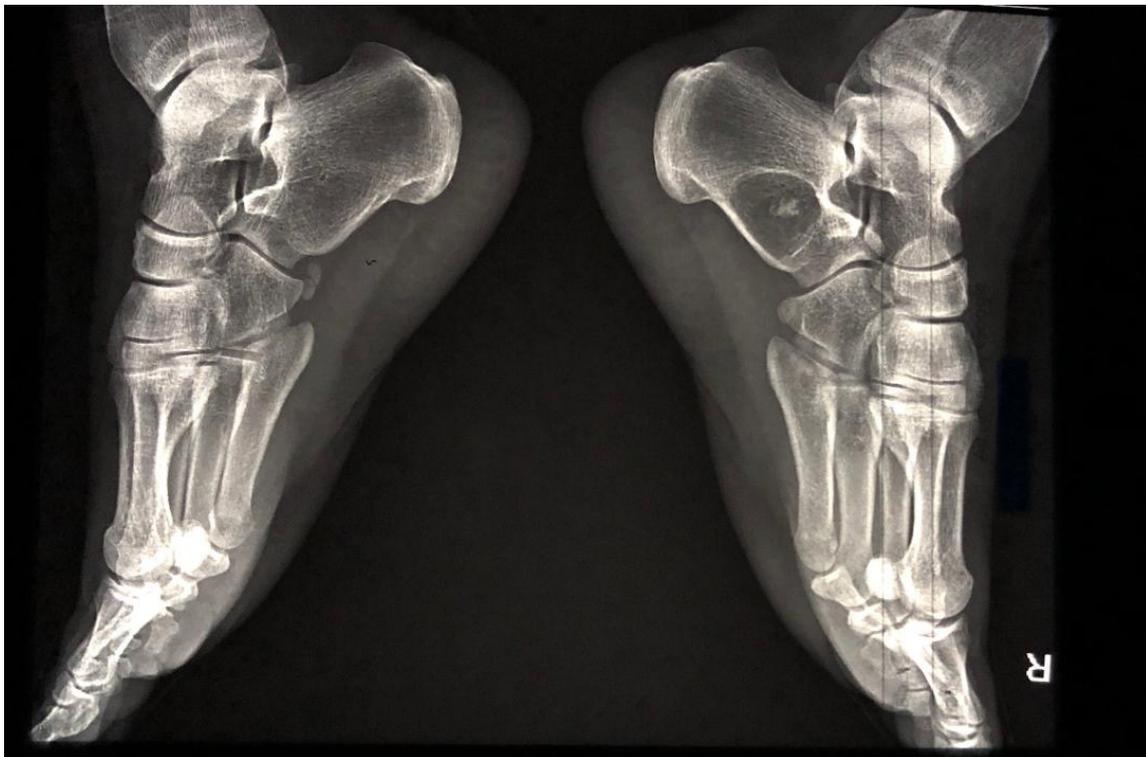


Figure 1. Lateral view of the plain radiograph of the foot (right and left).



Figure 2. Sagittal view of calcaneal computed tomography scan, lytic well-marginated lesion with central calcification.



Figure 3. Magnetic resonance imaging of the right ankle (calcaneal lesion with high signal intensity; a sagittal view of T1 weighted).

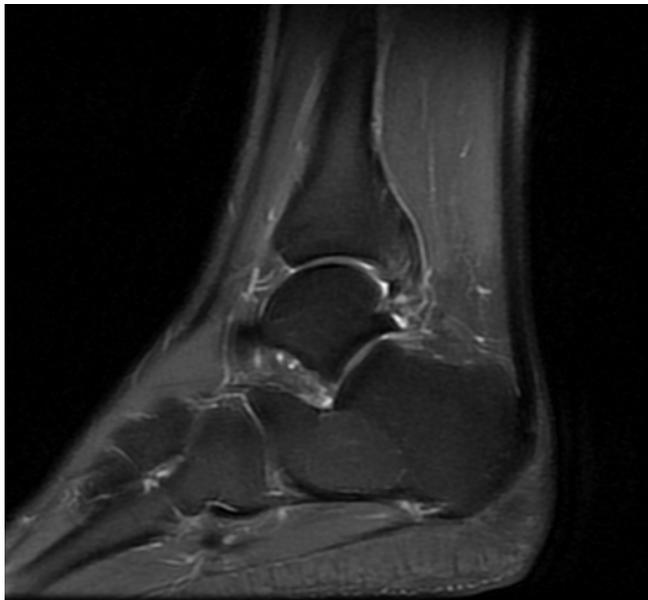


Figure 4. Magnetic resonance imaging of the right ankle (a sagittal view of T2 weighted-fat suppressed).



Figure 5. Lateral radiograph of calcaneus after curettage, bone grafting and plating.

complications. The patient was fitted with a below-knee non-weight bearing posterior splint for 3 weeks. In the third months after the operation, the patient returned to full ambulation. Consequently, radiographs demonstrated continued remodeling and healing of the graft site.

### Discussion

Incidence of intraosseous lipoma is assumed to account for less than 0.1% of all primary bone tumors. However, this lesion may have a much higher incidence since many patients are unlikely to be visited by a physician due to the absence of symptoms (12). This type of lesion

is usually found incidentally on radiographs, taken for an unrelated disorder. Such case of intraosseous lipoma was experienced in a patient suffering from long-term calcaneal pain, whose affliction was not improved after routine conservative treatments. It is needless to say that the most common finding in symptomatic calcaneal lipomas is pain (13).

Regarding this condition, the accurate etiology is unknown and controversial based on the recent literature (1). Some previous reports of intraosseous lipoma did not show any predilection for this condition in age groups or genders (7, 12). Nonetheless, there are a number of studies reporting the higher prevalence of this tumor in patients aged 30-60 years and males, in line with our study (7, 12, 13).

Radiographically, the lesions appeared osteolytic and well-margined, displaying a central area of calcification. In the present case and some previously published ones, a central sclerotic mass was also observed (7, 12, 14). Intraosseous calcaneal lipoma is usually located between the anterior and middle third of the calcaneus in X-ray, also referred to as neutral triangle. Similarly, lipoma in our case was located in neutral triangle; however, the lesion in our case was larger, compared to those previously reported (15). Moreover, the prophylactic fixation of the calcaneus with anatomical plate was performed during the operation. The goal of the surgery was to relieve pain, and prevent pathological fracture.

In our view, X-ray examination was indicated in

patients with consistent heel pain in order to rule out differential diagnoses of chronic heel pain, other than plantar fasciitis. In cases with unilateral lipoma of the calcaneus, other foot calcaneal X-ray examinations should also be prescribed to rule out the involvement of the opposite side.

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